REMARKS

Request for Reconsideration, Informal Matters, Claims Pending

The non-final office action mailed on 9 August 2007 has been considered carefully. Reconsideration of the referenced application is respectfully requested.

Claims 1-10 stand allowed. Claim 12 is objected for dependence on a rejected base claim.

Claim 17 has been amended to depend from Claim 27 instead of canceled Claim 15, which was previously rewritten as independent Claim 27. Claim 26 was amended to provide a proper antecedent basis for the "nth harmonic" and to eliminate the reference ("q") to the frequency divide ratio, an antecedent basis for which was previously provided in Claim 26.

Claims 1-14, 16-22 and 23-27 are pending.

Response to 35 USC 112, 2nd Paragraph Rejection

Rejection Summary

Claim 26 stands rejected under 35 USC 112, second paragraph, although the basis for the objection is not clear.

Discussion

Claim 26 recites that the "...the frequency divide ratio equals the harmonic number n." Support for this limitation may be found in the original

specification on page 13, lines 21-24. Contrary to the Examiner suggestion, the limitation at issue particularly points out and distinctly defines the metes and bounds of Claim 26, i.e., the "... frequency divide ratio equals the harmonic number n." Kindly withdraw the assert rejection.

Arguments re: Atkinson & Mouly

Rejection Summary

Claims 11, 18, 24 & 27 now stand rejected on new grounds Under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,731,923 (corresponding to previously cited U.S. Pub. No. 2001/0039182) (Atkinson) in view of Mouly.

Discussion of Claim 11

Regarding Claim 11, Atkinson and Mouly do not suggest a

> ... method in intermediate frequency and direct conversion receivers, comprising:
> receiving a signal;
> providing a mixer injection frequency by dividing a voltage controlled oscillator output by a frequency divide ratio,
> the voltage controlled oscillator having a frequency outside a bandwidth of received signal harmonics;
> mixing the received signal at a mixer injection frequency outside a bandwidth of a fundamental frequency of the received signal.

Atkinson discloses mixing the input RF signal with a local oscillator signal (34) that is at the same frequency (1.8 GHz) as the input RF signal. While the oscillator (38) of Atkinson has a frequency (.135 GHz) that is

different than the input RF signal frequency (1.8GHz), the mixer frequency (34) of Atkinson is not outside a bandwidth of a fundamental frequency of the received signal. Atkinson, paras. [0011 & 0019-20].

The Examiner admits that Atkinson fails to disclose a "... mixer injection frequency outside a bandwidth of a fundamental frequency of the received signal." The Examiner's reliance on Mouly to meet the deficiency of Atkinson is misplaced. The passages of Mouly cited by the Examiner merely discuss the frequencies allocated to GSM wireless communications systems. More particularly, at Section 4.2.2.1, Mouly discusses primary and secondary frequency bands allocated for in in GSM systems. The 900 MHz primary band has two 25 MHz sub-bands, one between 890-915MHz and another between 935-960 MHz. The secondary GSM band includes a domain between 1710-1785 MHz and another domain between 1805-1880 MHz. FIG. 4.17 of Mouly illustrates a 200 MHz carrier spacing between the GSM bands. The GSM frequency allocation discussed by Mouly is unrelated to the claimed limitation drawn to "...mixing the received signal at a mixer injection frequency outside a bandwidth of a fundamental frequency of the received signal." Claim 11 is thus patentably distinguished over Atkinson and Mouly et al.

Discussion of Claim 18

Regarding Claim 18, contrary to the Examiner's assertion, Atkinson and Mouly et al. fail to disclose or suggest, in combination with the limitations of Claim 11, "... mixing the received signal at a mixer injection frequency outside a channel bandwidth of the received signal."

Atkinson merely provides a VCO frequency (38) that is not harmonically related to the frequency of the input RF signal, without regard to

whether or not the mixer injection frequency (34) is outside the bandwidth of the input RF signal. Mouly merely discusses the primary and secondary frequency bands allocated for GSM systems. Claim 18 is thus further patentably distinguished over Atkinson and Mouly et al.

Discussion of Claim 24

Regarding Claim 24, Atkinson and Mouly et al. fail to suggest a

> ... method in intermediate frequency and direct conversion receivers, comprising:
> providing a mixer injection frequency at a frequency different than the receive frequency by dividing a voltage controlled oscillator output by a frequency divide ratio,
> the voltage controlled oscillator having a frequency outside a bandwidth of received signal harmonics.

In Atkinson, the mixer injection frequency (34) is the same as the received signal frequency. At paragraphs [0019-20], Atkinson discloses that only the VCO (38) is not harmonically related to the input RF signal. Atkinson is silent on the relationship between the VCO frequency and the bandwidth of received signal harmonics. The Examiner's assertion otherwise is not support by the prior art. In Atkinson, the VCO frequency may be within or without the received signal harmonics. Atkinson specifically states that the mixer injection frequency (34) is the same as the input REF signal frequency by virtue of the non-integer multiplier. The Examiner's reliance on Mouly to meet the deficiencies of Atkinson does not establish a prima facie case of obviousness. As noted above, the portions of Mouly cited by the Examiner merely discuss the primary and secondary frequency bands allocated for GSM systems. Claim 24 is thus patentably distinguished over Atkinson and Mouly.

Discussion of Claim 27

Regarding Claim 27, Atkinson and Mouly do not suggest

> ... method in intermediate frequency and direct conversion receivers, comprising:
> receiving a signal;
> providing a mixer injection frequency by dividing a voltage controlled oscillator output by a frequency divide ratio,
> the voltage controlled oscillator having a frequency outside a bandwidth of received signal harmonics;
> determining a condition of the received signal;
> mixing the received signal at the mixer injection frequency derived from a voltage controlled oscillator frequency that is outside the bandwidth of the harmonics of the received signal only if the condition of the received signal is above a threshold.

In Atkinson, the mixer injection frequency (34) is the same as the received signal frequency. At paragraphs [0019-20], Atkinson discloses that only the VCO (38) is not harmonically related to the input RF signal. Atkinson is silent on the relationship between the VCO frequency and the bandwidth of received signal harmonics. The Examiner's assertion otherwise is not support by the prior art. In Atkinson, the VCO frequency may be within or without the received signal harmonics. Atkinson specifically states that the mixer injection frequency (34) is the same as the input REF signal frequency by virtue of the non-integer multiplier. The Examiner's reliance on Mouly to meet the deficiencies of Atkinson does not establish a prima facie case of obviousness. As noted above, the portions of Mouly cited by the Examiner merely discuss the primary and secondary frequency bands allocated for GSM systems. Claim 27 is thus patentably distinguished over Atkinson and Mouly.

Arguments re: Atkinson, Mouly & Atkinson '518

Rejection Summary

Claims 13-14 and 26 now stand rejected on new grounds Under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,731,923 (corresponding to previously cited U.S. Pub. No. 2001/0039182) (Atkinson) in view of Mouly and U.S. Patent No. 6,785,518 (Atkinson '518).

Discussion of Claim 26

Regarding Claim 26, Atkinson, Mouly and Atkinson '518 do not suggest a

> ... method in intermediate frequency and direct conversion receivers, comprising:
> receiving a signal;
> providing a mixer injection frequency by dividing a voltage controlled oscillator output by a frequency divide ratio,
> the voltage controlled oscillator having a frequency outside a bandwidth of received signal harmonics;
> mixing the received signal at a mixer injection frequency derived from a VCO frequency that is outside a bandwidth of the n^{th} harmonic of the received signal,
> the frequency divide ratio equals the harmonic number n.

Atkinson discloses mixing the input RF signal with a local oscillator signal (34) that is at the same frequency (1.8 GHz) as the input RF signal. The Examiner concedes that mixer frequency (34) of Atkinson is not outside a bandwidth of a fundamental frequency of the received signal. Atkinson paras. [0011 & 0019-20]. The Examiner's reliance on Mouly to meet

the deficiencies of Atkinson does not establish a prima facie case of obviousness. As noted above, the portions of Mouly cited by the Examiner merely discuss the primary and secondary frequency bands allocated for GSM systems.

Atkinson '518 does not meet the limitation in Claim 26 that the "... frequency divide ratio equals the harmonic number n". At col. 3, lines 58-62, Atkinson '518 discusses a frequency divider (56) that is switchable between different multipliers to provide a local oscillator signal for receiving either 900 or 1800 MHz signals. At col. 5, lines 51-58, Atkinson '518 discusses frequency divide values (m & n) required to produce a 900 MHz oscillator output. At col. 6, lines 30-33, Atkinson '518 suggests that other frequency divide values may be used in other embodiments. Atkinson '518 does not discuss the relationship between the frequency divide ratio and harmonics of a received signal. Atkinson '518 also fails to meet the deficiencies of Atkinson and Mouly. Claim 26 is thus patentably distinguished over Atkinson, Mouly and Atkinson '518.

Arguments re: Arpaia

Rejection Summary

Claims 19 & 25 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,192,225 (Arpaia).

Discussion of Claim 19

Regarding Claim 19, Arpaia fail to suggest a

> ... method in an RF receiver, comprising:
> receiving a signal within a passband of a pre-selection filter of the receiver;
> mixing the received signal at a mixer injection frequency outside the passband of the pre-selection filter;
> chopping the received signal before and after mixing at the same chopper frequency,
> the chopper frequency proportional to the mixer injection frequency.

Arpaia does not mix the received signal with "... a mixer injection frequency outside the passband of the pre-selection filter..." At col. 4, lines 6-8, Arpaia discloses that the frequency f_o of the local oscillator (4) (mixer injection frequency) is the same as the carrier frequency of the received signal. Arpaia changes only the phase (not the frequency) of the local oscillator signal. At col. 4, lines 47-50 & lines 63-67, Arpaia indicates that the frequency of the switching oscillator (7) is greater than the bandwidth of the preselector filter. In Arpaia, the mixer injection frequency is controlled by the oscillator (4). not the switching oscillator (7). For this reason alone, Claim 19 and dependent Claims 20-21 are therefore patentably distinguished over Arpaia.

Demand for Citation of Authority

The Examiner's assertion that it would have been obvious to chop the signal before mixing is not supported by the prior art. That it may be known to chop before mixing, as asserted by the Examiner, does not suggest chopping the received signal "... before and after mixing at the same chopper frequency..." Applicant's hereby demand that the Examiner cite prior art reference supporting the Examiner's suggestion that "...chopping the received signal before and after mixing at the same chopper frequency ..." it is well

known. Absent shuch a showing, Claim 19 and dependent Claims 20-21 are further patentably distinguished over Arpaia.

Discussion of Claim 25

Regarding Claim 25, Arpaia fails to suggest a

> ... method in an RF receiver, the method comprising:
> receiving a signal within a passband of a pre-selection filter of the receiver;
> mixing the received signal at a mixer injection frequency outside the passband of the pre-selection filter;
> chopping the received signal at a chopper frequency proportional to the mixer injection frequency.

At col. 4, lines 6-8, Arpaia discloses that the frequency f_o of the local oscillator (4) (mixer injection frequency) is the same as the carrier frequency of the received signal. Arpaia changes only the phase (not the frequency) of the local oscillator signal. In Arpaia, although the frequency of the switching oscillator (7) is greater than the bandwidth of the preselector filter, the switching oscillator is not the same as the mixer injection frequency. In Arpaia, the local oscillator (4) controls the mixer injection frequency. Claim 25 is thus patentably distinguished over Arpaia.

Arguments re: Arpaia & Freed

Rejection Summary

Claims 20 and 21 stand rejected under 35 USC 103 as being unpatentable over U.S. Patent No. 6,192,225 (Arpaia) and U.S. Patent No. 6,487,419 (Freed).

Discussion of Claim 20

Regarding Claim 20, neither Arpaia nor Freed disclose or suggest "... increasing a gain of the received signal before mixing if the received signal gain is below a threshold" in combination with the limitations of Claim 19. Claim 20 is thus further patentably distinguished over Arpaia and Freed.

Discussion of Claim 21

Regarding Claim 21, neither Arpaia nor Freed suggest in combination with the limitations of Claim 19,

> ... mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter if the measured gain is below the threshold.

Contrary to the Examiner's assertion Arpaia and Freed do not conditionally mix the received signal with a mixer injection frequency that is either within or without the pass band of a pre-selection filter dependent on gain. In Arpaia, the frequency f_o of the local oscillator (4) (mixer injection frequency) is the same as the carrier frequency of the received signal. Freed discloses adjusting the gain of an amplifier associated with a mixer and a third

order LNA intercept based on received signal strength. Claim 21 is thus patentably distinguished over Arpaia and Freed.

Arguments re: Arpaia, Atkinson & Mouly

Rejection Summary

Claims 22 and 23 stand rejected Under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,192,225 (Arpaia) in view of U.S. Patent No. 6,731,923 (corresponding to previously cited U.S. Pub. No. 2001/0039182) (Atkinson) and Mouly.

Discussion of Claim 22

Regarding Claim 22, Arpaia, Atkinson and Mouly fail to suggest a

> ... method in intermediate frequency and direct conversion receivers, comprising:
> chopping a received signal;
> mixing the received signal after chopping at a mixer injection frequency;
> providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio,
> a harmonic of the received signal corresponding to the divide ratio of the frequency divider.

In Arpaia, the frequency f_o of the local oscillator (4) (mixer injection frequency) is the same as the carrier frequency of the received signal. Arpaia, col. 4, lines 6-8. Arpaia does not multiple the local oscillator output by any factor. Arpaia changes only the phase (not the frequency) of the local

oscillator signal. Atkinson multiplies the frequency F_3 of the VCO 38 by a non-integer factor ($^4/_3$) selected so that the mixer injection frequency (34) is equal to the frequency of the input RF signal. See Atkinson, para. [0019]. There is no disclosure or suggestion in Arpaia, Atkinson ort Mouly that the non-integer factor is related to a received signal harmonic. Claim 22 is thus patentably distinguished over Arpaia, Atkinson and Mouly et al.

Prayer for Relief

Kindly withdraw the rejections of claims, in view of the discussion and amendments above, and allow the Claims to issue in a United States Patent without further delay.

Respectfully submitted,

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